

**Maryland
Transportation
Authority**

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Governor

Anthony Brown
Lt. Governor

Beverley K Swain-Staley
Chairman

Peter J. Basso
Rev. Dr. William C. Calhoun, Sr.
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May 20, 2010

TO ALL PURCHASERS OF CONTRACT DOCUMENTS:

RE: Contract No. MA-679-000-002
Upgrade and Replace Existing Signing – Northern Region

ADDENDUM NO. 4

Ladies and Gentlemen:

It is important that you acknowledge receipt of this Addendum No. 4 on the referenced contract regardless if you will be bidding or not bidding.

Very truly yours,

Linda D. McGill, CPPB
Chief of Engineering & Construction Procurement

LM/UPM

Enclosures

Contract No. **MA-679-000-002**

This will acknowledge receipt of the attached Addendum No. 4.

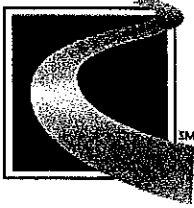
NAME OF COMPANY

SIGNATURE

DATE

THIS SIGNED ADDENDUM ACKNOWLEDGEMENT PAGE SHALL BE RETURNED TO THIS OFFICE VIA **FAX AT 410-537-7801**, ATTENTION: MAGGIE JOHNSON PRIOR TO THE BID OPENING DATE.

IN ADDITION, THIS SIGNED ADDENDUM ACKNOWLEDGEMENT PAGE MUST BE ATTACHED TO THE OUTSIDE COVER OF THE BID BOOK. FAILURE TO DO SO MAY RESULT IN REJECTION OF YOUR BID.



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May 20, 2010

TO ALL PURCHASER'S OF CONTRACT DOCUMENTS

ADDENDUM NO. 4

RE: Contract No. MA-679-000-002
Upgrade and Replace Existing Signing – Northern Region

To Whom It May Concern:

- I. The deadline for receipt of bids remains 12:00 noon on **May 27, 2010.**
- II. The Department of Labor, Licensing and Regulation (DLLR) "Sign Erector" wage rate distributed under Addendum 2, has been confirmed by DLLR and remain as stated in Addendum 2. Questions regarding wage rates should be addressed to the Prevailing Wage Unit, Division of Labor and Industry of the Maryland Department of Labor, Licensing and Regulation, 1100 N. Eutaw Street, Room 607, Baltimore, MD 21202-2272..
- III. The following changes have been made to the Invitation for Bids book:
 - a. Delete Pages iii and 64, and replace them with new pages numbered the same with the Addendum No.4 notation, attached herein.
 - b. Add new Pages 63A thru 63H, with the Addendum No.4 notation, attached herein.

Very truly yours,

Linda D. McGill, CPPB
Chief of Engineering & Construction Procurement

RYM/UEM

THIS ADDENDUM SIGNED ACKNOWLEDGEMENT PAGE MUST BE ATTACHED TO THE OUTSIDE COVER OF THE BID BOOK. FAILURE TO DO SO MAY RESULT IN REJECTION OF YOUR BID.

THE ATTACHED SIGNED ADDENDUM ACKNOWLEDGEMENT PAGE SHALL BE RETURNED TO THIS OFFICE VIA FAX AT 410-537-7801, ATTENTION: MAGGIE JOHNSON, PRIOR TO THE BID OPENING DATE.



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SPECIAL PROVISIONS

Contract No. MA-679-000-002

	<u>Page No.</u>
Section 800-8 Sign Structure Identification Number Label	60
Section 800-9 Contingent Rock Excavation.....	60A-60B
Section 803 Overhead Sign Structures	61
Section 809 Trenching and Backfilling.....	62-63
Section 820 General Electrical Work and Testing	63A-63H
Section 822 Remove and Relocate Existing Signs and Sign Structures	64
Section 830 Common Work Results for Electrical	65
Section 832 Electrical Identification	66
Section 902 Portland Cement Concrete and Related Products.....	67-81
Section 908 Reinforcement Steel	82
Section 950.03 Reflectorization of Signs and Channelizing Devices	83
Section 950.06 Electrical Cable and Wire.....	84
Section 950.12 Luminaries and Lamps	85
Section 951.04 Removable Preformed Pavement Marking Material.....	86-88
Wage Rates	89-96
Contractor Affirmative Action Program.....	97-113
Affirmative Action Requirements Utilization of Minority Business Enterprises for Straight State Contracts.....	114-119
Proposal Form.....	120
Schedule of Prices.....	121-147
Contract Time and Bonding.....	148
Buy American Steel Act	149-151
Exhibit to Solicitation State of Maryland - Maryland Transportation Authority Minority Business Enterprise Participation	152-162
Bid/Proposal Affidavit.....	163-173
Escrow Account For Retained Funds	174



SECTION 820 GENERAL ELECTRICAL WORK AND TESTING

See Section 820 of the SHA's *Standard Specifications for Construction and Materials* in conjunction with the changes shown in this Section.

820.01 DESCRIPTION

ADD: The following.

- (a) This work includes contacting, coordinating and cooperating with local power companies for the changes and additions to the electrical service.
- (b) The Plans show only diagrammatic locations of cables, conduits, and other underground utilities. They are approximate and do not show every detail. The Contractor shall provide working drawings, shop drawings, and catalog cuts, etc., which show final details of the installation.

820.01.01 Codes, Standards, Inspection, and Documentation

- (a) All work shall be performed in accordance with the codes and standards listed below. In addition, materials and construction methods shall meet the minimum requirements and recommendations of the listed codes, standards, and organizations. Unless otherwise stated, the latest edition, revision, or supplement, as of the date of advertisement, of the specified codes shall be used.
 - ANSI - American National Standards Institute
 - ASTM - American Society for Testing and Materials
 - IEEE - Institute of Electrical and Electronic Engineers
 - NEC - National Electrical Code (NFPA70)
 - NEMA - National Electrical Manufacturers Association
 - NESC - National Electrical Safety Code
 - NFPA - National Fire Protection Association
 - UL - Underwriters' Laboratories
 - TIA - Telecommunications Industry Association
- (b) All materials supplied by the contractor shall be new and UL listed, where such listing is possible. Submit catalog cuts for all materials in accordance with Shop Plans & Working Drawings in SPECIAL PROVISIONS (TC4.01).

- (c) The MDTA Chief Electrical Inspector or his appointed representative will inspect the entire installation. The Contractor shall contact the Electrical Inspector at least 48 hours before needed inspections. All trenches shall be inspected before backfilling. All equipment, conduits, etc. shall be inspected at rough in and prior to concealment. All work shall be inspected prior to power-up. Contact the Chief Electrical Inspector, Douglas Evans, at 410-977-2687 or devans3@mdta.state.md.us to arrange necessary inspections.
- (d) All rough-in work shall be documented via a digital camera prior to concealment. Camera shall be color, minimum of 5 mega pixels, and images shall be clear and readable to the naked eye. All color photos shall be time stamped with the date of the picture. Filename or other label shall identify project number and general location of the picture. All pictures shall be submitted on a CD or DVD at the conclusion of the project, however, electronic copies shall be made available at any time by request to the project engineer, inspector, and/or electrical inspector.
- (e) Special attention is directed to the fact that the Standard Specifications For Construction and Materials dated July 2008 and published by the Maryland Department of Transportation, State Highway Administration, also governs this work, and is referenced frequently herein as the "Specifications."
- (f) All work shall be performed in accordance with NECA 1-2006 (Standard for Good Workmanship in Electrical Construction) or latest revision.
- (g) Unless clearly specified otherwise, all voltages indicated are AC (alternating current), shall be at 60 Hz, and stated as RMS values.

820.01.02 Quality Assurance and Quality Control

The contractor shall inspect all materials furnished or installed under this contract and shall bring any damage, failure, or other problem to the attention of the project inspector prior to incorporation into the work. The contractor shall provide his own quality assurance and quality control for the work performed in the contract. The inspectors operating on behalf of the state are not a replacement for contractor's management and the contractor's own quality assurance and quality control.

Prior to final inspections/punch list development the contractor shall conduct his own inspections. The use of inspection checklists and quality control documents is required as evidence that inspections have been completed.

820.01.03 Fire-stopping

- (h) All penetrations into fire walls or core holes between floors and walls must be properly fire-stopped in accordance NEC requirements for fire stopping.

- (i) Penetrations into the surface of any firewall or presumed firewall should be only slightly larger than the cable or cables that will need to pass through it. This will make fire stopping easier and allow the wall to maintain a better over all structural integrity.

820.03 CONSTRUCTION

820.03.01 GENERAL

ADD: The following.

For the purpose of this specification, "direct supervision" shall mean that the qualified Master Electrician shall be at the job site at all times electrical work is performed. This includes digging trenches and construction of manholes for electrical work. The Master Electrician shall be the single point of contact for inspection and quality control issues related to electrical work and shall be able to effectively manage the electrical work force.

The contractor must provide qualified labor to perform installation. Where licenses or certifications are available or required by local jurisdictions, state jurisdictions, or federal jurisdictions for certain skilled trades, such as electrical, mechanical, plumbing, welding, etc. The skilled trade workers shall have current versions of the appropriate license or certification prior to working the associated specialty and shall provide copies to the Project Engineer or Inspectors upon request.

Installation, splicing, terminating, and testing of fiber optic cable shall be performed by a trained and qualified fiber optic cable technician. Copies of certifications and experience shall be submitted to the Engineer prior to starting work.

ADD: The following just prior to paragraph 820.04.

820.03.04 Testing Fiber Optic Cables

Circuit tests shall be performed to verify that each fiber is connected to the proper circuit, and that it is continuous with no breaks, or damaged sections, in the fiber. All strands shall meet current EIA/TIA-568 specifications. Dark fibers and excessive attenuation due to breaks, bends, bad splices, defective connectors and bad installation practices shall not be accepted and shall be corrected. For fiber optic testing standards, see EIA-455-171 (FOTP-171), EIA 526-14.

- (a) All cables shall have ST connectors installed prior to testing. All testing, for purposes of acceptance of the system, shall be conducted on fully installed and assembled fiber optic cables.
- (b) Upon completion of testing, replace or repair any failed cable(s) with a new fiber or cable, and test the new cable to demonstrate acceptability.
- (c) Insertion loss testing shall be performed.

- (d) These tests shall be measured in dB.
- (e) These tests shall use 850 nm and 1300 nm light sources for multimode fiber and 1300 and 1550 nm for single mode fiber.
- (f) Test shall be documented for all wavelengths as noted above.
- (g) Test results shall be documented on paper and stored on a computer diskette and shall be turned over to the electrical inspector after testing is complete. Attachment 820-A to this Section shows a sample fiber optic test report.
- (h) An optical time domain reflectometer (OTDR) approved by the Engineer shall be used to conduct testing. The OTDR shall be calibrated to sheath (jacket) length, not optical length, by adjusting the unit's index of refraction. Properly trained technicians shall conduct tests.
- (i) All OTDR traces shall maximize both the vertical and horizontal scales to the greatest extent possible and still fit the entire trace on the screen.
- (j) A cable segment shall be deemed a failure if the total loss exceeds the calculated loss for that length of cable as indicated in Attachment 820-A. A cable segment shall fail if any individual splice loss is greater than 0.3dB, or if any mated connector pair loss is greater than 1.0dB, or if there is any point loss (over less than 1' of cable) of more than 1.0dB.
- (k) After the circuit test, a functional test shall be performed. This test shall consist of allowing the system to operate as normal for 30 consecutive days. Any failures shall be repaired by the Contractor at his own expense, and the test restarted.

820.03.05 All switches and breakers shall be operational and the operation of the devices they control verified. That is, the Contractor shall test switches and breakers in the presence of the MDTA electrical inspector to prove and assure that the device (or devices) specified is (are) controlled and no other device (or devices) is (are) controlled. All panel schedules shall be accurate and reflect the final installation.

820.03.06 All GFI protected outlets shall be tested with a suitable tester in the presence of the MDTA electrical inspector. The tester shall be a device that plugs into the outlet and indicates proper wiring of the outlet. A switch on the tester shall be utilized to introduce a ground fault that must trip the GFI device.

820.03.07 All Uninterruptible Power Supplies shall be tested by removal of power sources. Verify proper transfer to battery and backup time consistent with the manufacturers load vs time data for the particular model of UPS. Restore normal power and verify that batteries are charged and normal operation commences.

820.03.08 All PVC conduit fittings, except threaded fittings, shall be schedule 80 and glued and water tight. All GRSC fittings shall be tight fit.

820.03.09 All photo electric controls shall be tested by applying a temporary shade to simulate photometric changes intended to activate the controls. Such testing shall be performed by the contractor in the presence of the MDTA electrical inspector.

820.03.10 All three phase panels, loads, motors, generators, UPS's, and ATS's shall be checked for proper phase rotation and consistent phase termination between termination points. I.e: Phase A is the same Phase at all Phase A termination points and the phase rotation is the same at all points. Such testing shall be performed by the contractor and witnessed by the electrical inspector.

820.03.11 Flexible metal conduit (Greenfield) and liquid tight flexible metal conduit (seal tight), and liquid tight flexible non-metallic conduit may be used as follows. Flexible fabric innerduct and innerduct used for low-voltage and fiber optic systems is not covered by this requirement.

(a) Lengths not exceeding 3' shall be used to connect transformers over 5KVA and motors.

(b) Lengths not exceeding 6' may be used for the final connection of light fixtures used in ceilings.

I Lengths not exceeding 6" may be used for the final connection devices that may be subject to minor vibration or minor movement perhaps from temperature expansion and contraction.

(d) Other lengths as clearly specified on the plans or as approved by the Engineer.

820.03.12 Conduit/Cable labeling. Interior cable and raceways shall be permanently labeled at a minimum of every 50 feet, **every 25 feet when view is obstructed, and within 5' of any wall or floor/ceiling penetration** at all junction boxes, terminations, **and within 12" of electrical panel**. Label color shall be Safety Orange with Black Letters and shall follow ANSI (ASME) A13.1 for location and size.

820.03.13 Unless specifically shown otherwise on the plans, wiring derived from different system voltages shall be installed in separate conduits. Wiring of different voltages derived from the same system (i.e. Control wiring) may be permitted to be installed in the same conduit or junction box provided that all requirements of the NEC are maintained.

820.03.14 No wiring other than the primary voltage indicated shall be installed in electrical panels and Safety/Disconnect Switches. Exception may be granted for wiring that terminates on a device within the panelboard or safety/disconnect switch that is integral to the operation of that device. Enclosures for switches or overcurrent devices shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices.

820.03.15 Branch Circuits: Any circuits supplying more than 50% non-linear loads shall have a dedicated neutral conductor

820.03.16 Conduit or tubing 1" and larger shall be provided with a suitable insulating bushing.

820.03.17 Panel Board Labeling. All circuits installed or modified by the contractor in any way shall be properly labeled in the associated panel board panel schedule. This work shall include verifying that the existing load on the affected circuit(s) is also correctly identified. The label shall identify the type of load(s) served (e.g.: receptacles, lighting, appliances, motors, pumps, etc..) and the location (e.g.: room 103, sump pit#1, etc...). Where changes are minor (e.g. Two circuits or less being changed), the existing panel schedule may be modified as approved by the Electrical Inspector. Larger changes shall require a new panel schedule typed, neat in appearance. The new schedule may copy the identifying labels of the old schedule provided that the contractor has not made any changes to those circuits. To clarify, replacing a panel board, moving circuits within a panel board, or similar changes shall be considered modifying the circuit and shall require testing to verify the connections of all such circuits and coordinating the panel schedule with the existing conditions.

820.03.18 Fire Stopping. All penetrations into fire walls or core holes between floors and walls must be properly fire-stopped in accordance NEC requirements for fire stopping. Penetrations into the surface of any firewall or presumed firewall should be only slightly larger than the conduit, cable or cables that will need to pass through it. This will make fire stopping easier and allow the wall to maintain a better overall structural integrity.

820.03.19 Construction Stakeout and Coordination

- a) The Contractor shall coordinate this work with the work of other trades to avoid conflicts. Electrical cables and equipment damaged by the execution of work of other trades shall be completely removed and replaced with new.
- b) The Contractor shall keep an up-to-date set of as-built red lined drawings on the job site. Submit as-built drawings upon completion of the work. The Contractor shall note the exact location of trenches at 100-foot intervals on the as-built drawings by station, and offset from the roadway. The Contractor shall show only the work that is part of the final project on as-built drawings.

820.03.20 Boxes and Cabinets. Unless specified otherwise, junction boxes, pull boxes, disconnect switches, cabinets, and other boxes installed outdoors and above ground shall be NEMA4X rated; except cabinets and boxes requiring ventilation which shall be NEMA3X rated.

820.03.21 Rodent stopping. All conduits that connect to exterior mounted cabinets shall be stuffed with copper mesh at the cabinet end point to deter rodent egress through the conduit. The copper mesh shall be installed after all wires and cables have been installed. The mesh shall be removable and the mesh and installation and removal technique shall not damage wires or cables.



ATTACHMENT 820-A
SAMPLE FIBER OPTIC CABLE TEST REPORT

(To be filled out after installation is complete)

Job Name: FIBER SPURS Job ID: MA-247-000-006	Fiber Cable:
Location (A):	Location (B):

ANSI/EIA/TIA 568A: Cable Loss Factor (CLF); 1km=3280.83 feet

3.75 db/km (0.00114 db/ft) @ 850 nm for 62.5/125 µm MM

0.50 db/km (0.00045 db/ft) @ 1300 nm for 62.5/125 µm MM

0.50 db/km (0.00015 db/ft) @ 1310 nm and 1550 nm for OSP SM

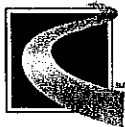
1.0 db/km (0.00030 db/ft) @ 1310 nm and 1550 nm for ISP SM

0.5 Connector Loss (CL) = 0.75 db per pair of connectors

Splice Loss (SL) = 0.3 db each

To calculate ACCEPTABLE LOSS (db): Multiply cable length x (CLF) + (CL) + (SL) = DB margin: _____

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
850 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua



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SPECIAL PROVISIONS

Contract No. MA-679-000-002

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1300 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1550 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Technician: _____ Date: _____



**CATEGORY 800
TRAFFIC**

**SECTION 822-REMOVE AND RELOCATE
EXISTING SIGNS AND SIGN STRUCTURES**

650 **DELETE:** 822.04.02 in its entirety

INSERT: The following:

822.04.02 Remove Signs from Existing Overhead Structure will be measured and paid for at the Contract unit price per square foot area of the sign. Removal of sign luminaire supports, luminaires, catwalks, conduit and cable will not be measured but the cost will be incidental to the Contract unit price for removing the signs.

DELETE: 822.04.04 in its entirety

INSERT: The following:

822.04.04 Relocate Signs from Existing Overhead Structure will be measured and paid for at the Contract unit price per square foot area of the sign. Removal and relocation of sign supports, luminaires, and luminaire supports will not be measured but the cost will be incidental to the Contract unit price for relocating the signs.

Existing hardware will be permitted to be used if they are in good & usable condition after removal. If existing hardware is damaged in any way, including due to no fault of the Contractor, the Contractor shall provide new hardware and costs there of will be incidental to this item.